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Prognosis after heart transplantation

Transplants alone cannot be the solution for end stage heart failure

Heart transplantation is in its third decade as a widely accepted treatment for advanced heart failure. What is its prognosis? In the early era of heart transplantation, the perceived alternative to transplantation was imminent death. In 1968, at the beginning of heart transplantation, Peter Medawar, the eminent zoologist and Nobel laureate whose work on tolerance set the scene for successful transplantation, correctly predicted: "The transplantation of human organs will be assimilated into ordinary clinical practice … and there is no need to be philosophical about it. This will come about for the single and sufficient reason that people are so constituted that they would rather be alive than dead."[1]

Heart transplantation has a high early mortality—15-20% of recipients die within a year of the operation.[2 3] Thereafter the death rate is constant, at about 4% a year for the next 18 years, so that 50% of patients can expect to be alive after 10 years and 15% after 20 years. Application of heart transplantation has been based almost entirely on doctors' judgment in a non-investigational clinical setting. No prospective comparative studies have evaluated its effectiveness. For this reason, practically all data to guide prognosis arise from case series and registries. The registry of the International Society for Heart and Lung Transplantation has collected data on over 60 000 heart transplants performed worldwide over the past two decades and provides the largest source of such data.[2]

Predictors of poorer survival in recipients of heart transplants include increasing age, coming to surgery already on mechanical cardiac support or on a ventilator, and high pulmonary vascular resistance. Another major variable, without parallel in other forms of implant surgery, is a marked variation in quality of the implant—the donor heart. Age of the donor, sex, prior need for inotropic support, and duration of graft ischaemia all have an impact on the quality of the donor heart and therefore on survival of the recipient. At the time of deciding if a patient should be listed for transplantation these donor factors cannot be known. Thus a 20 year old man with dilated cardiomyopathy, who opts for transplantation expecting a longer life, may get less than hoped for if his new heart were to come from a 50 year old female donor in a hospital four hours away who is being treated with inotropes.[4] Predicting prognosis before transplantation is difficult because of this heterogeneity of donors and also variations in the selection of recipients and donors, and unique immunological interactions between donor and recipient.

Transplantation is effective in relieving the symptoms of heart failure. Over 90% of survivors are in New York Heart Association class I or II and report minimal limitation in activity.[2 3] Survivors report good quality of life through the post-transplant period, with a decline in the months preceding death. However, these are people who are glad to be alive, and we know from other beneficiaries of cardiac surgery that they make great adjustments to their expectations.[5] They never regain full health as the immunological effects of the donor heart and requirement for immunosuppression introduce new sources of illness. Patients require regular hospital surveillance and often repeat admission to hospital. By the sixth year after transplantation, most patients are hyperlipidaemic, about a third have abnormal renal function, a third will have transplant coronary artery disease, and a fifth would have experienced malignancy (mainly skin cancer or lymphoma).[1]

The options for the potential transplant recipient, however, have changed. Data from recent trials of angiotensin converting enzyme inhibitors in advanced heart failure indicate that up to 90% of patients are alive a year after starting treatment.[6] Furthermore, surgical alternatives to transplantation, such as implantable ventricular assist devices, are being developed. Therefore, whereas 20 years ago death was a near certainty without a transplant, and any length of survival after heart transplantation was regarded as a bonus, in the present era some patients potentially have a similar prognosis with alternative treatments.

Medawar was less optimistic about other developments of the 20th century, which he compared to the dinosaur or the zeppelin.[7] Both, he argued, were impressive in their time but each was ultimately a "cul de sac" in terms of evolution and development. For the dinosaur and the zeppelin it was the end of the road. Progress took another route. Will the same be true of transplantation of the human heart? Transplant related activity is declining and is likely to continue to do so.[8] It is by its nature always going to be capped by the limited availability of suitable donors. Human donor heart transplantation cannot increase sufficiently in number to have an impact on loss of life and health due to heart failure. Both in numbers and in efficacy it has plateaued—registry data show no substantial improvement in the past decade.[1] Although heart transplantation currently offers unparalleled

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symptomatic relief and restoration of quality of life, because only a privileged minority receive transplants, transplantation alone cannot solve the increasing public health problem of end stage heart failure. The future probably lies in further development of alternative treatments—time will tell whether these will eventually eclipse transplantation of the human heart.

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The health of indigenous peoples

Depends on genetics, politics, and socioeconomic factors

When launching the international decade for the world's indigenous peoples in 1994, the president of the United Nations General Assembly warned of the dire circumstances facing indigenous peoples: "Their social structures and lifestyles have suffered the repercussions of modern development."[1] Although there is no single definition of indigenous peoples, an ancient relationship with a defined territory and ethnic distinctiveness are two distinguishing features. There are some 5000 indigenous groups with a total population of about 200 million, or around 4% of the global population.[2]

The 1999 Declaration on the Health and Survival of Indigenous Peoples by the World Health Organization proposed a definition of indigenous health: "Indigenous peoples' concept of health and survival is both a collective and an individual inter-generational continuum encompassing a holistic perspective incorporating four distinct shared dimensions of life. These dimensions are the spiritual, the intellectual, physical, and emotional. Linking these four fundamental dimensions, health and survival manifests itself on multiple levels where the past, present, and future co-exist simultaneously."[3]

Although the standards of health of indigenous peoples show differences, similarities exist in worldviews, patterns of disease, health determinants, and healthcare strategies. In the 18th and 19h centuries, for example, groups as diverse as Maori in New Zealand, Australian Aborigines, native Hawaiians, the Saami of Norway, native Americans, and the First Nations of Canada were nearly decimated by infectious diseases including measles, typhoid fever, tuberculosis, and influenza.[4] For the First Nations, epidemics of smallpox produced even greater suffering.[5]

By the mid-20th century, however, following the near universal experience of urbanisation other health risks emerged. While communicable diseases continue to affect large indigenous populations, vulnerability to injury, alcohol and drug misuse, cancer, ischaemic heart disease, kidney disease, obesity, suicide, and diabetes have become the modern indigenous health hazards.[6]

Notwithstanding changes in statistical definitions and variable practices of enumeration, which make comparisons difficult, inequalities in health status are an important measure of the quality of the health system. Indigenous populations generally have a lower life expectancy than non-indigenous populations, a higher incidence of most diseases (for example, diabetes, mental disorders, cancers), and experience of third world diseases (tuberculosis, rheumatic fever) in developed countries.[7]

Leaving aside views of early colonists about "backward peoples,"[8] explanations for current indigenous health status can be grouped into four main propositions: genetic vulnerability, socioeconomic disadvantage, resource alienation, and political oppression. Genetic causes have been investigated in diabetes, alcohol related disorders, and some cancers, although they are generally regarded as less significant than socioeconomic disadvantage, which is often central to contemporary indigenous experience. Poor housing, low educational achievement, unemployment, inadequate incomes, are known to correlate with a range of lifestyles that predispose to disease and injury.[9] Alienation from natural resources along with environmental degradation has also been identified as a cause of poor health while cultural alienation has been recognised as an important consideration for effective health care.[10]

Where doctor and patient are from different cultural backgrounds the likelihood of misdiagnosis and non-compliance is greater. Several writers have drawn a link between colonisation and poor health.[11] They argue that loss of sovereignty along with dispossession (of lands, waterways, customary laws) has created a climate of material and spiritual oppression with increased susceptibility to disease and injury.

All four propositions can be more or less justified and conceptualised as a causal continuum. At one end are "short distance" factors, such as the impacts of abnormal cellular processes, whereas at the other end are "long distance" factors, including government

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